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Miscellaneous.—Fremy[1] has succeeded in obtaining small well-colored crystals of ruby by subjecting to a red heat a mixture of alumina and minium, and also by heating to a high temperature equal weights of alumina and barium fluoride. In both cases the color was produced by the addition of small quantities of potassium bi-chromate.——Measurable crystals of quartz have been produced[2] by heating an enclosed dialysed solution of silica to a temperature of 320°. The crystals, ½ mm. in length, possessed the forms R, —R, $\propto$R, and in two cases $+\frac{2P2}{4}$. Tridymite was obtained by fusing pieces of very acid rocks with the powder of basalts and melaphyres.——A concretion of coarse tourmaline pegmatite in the tourmaline granite near Pisek, Bohemia, contains pseudomorphs[3] of pyrite after tourmaline.——The rare mineral langite has been found by Von Foullon[4] forming the cement of a breccia in Pockwerke, Garnstein.

ENTOMOLOGY.[5]

Observations on the Female Form of Phengodes laticollis Horn.—Entomologists will remember the interest taken, about one year ago, in the discovery that the female form of a Lampyrid[6] (*Zarhipis riversi*) was larva-like, and that the three stages—larva, pupa, and adult—differed but little. On the night of September 27, 1886, a larviform, luminous beetle was collected on one of the walks of the campus of the University of North Carolina.

Pupa State.—As the insect cast its skin only once—in the spring of 1887—after coming into my possession, this must represent its pupa state.

Description.—Length when crawling, two and three-fourths inches; width, three-eighths inch. Flattened, larviform, luminous; composed of twelve segments (exclusive of the head), tapering gently behind, and more decidedly on the three anterior segments. Chitinous plates on dorsum blackish-brown, the second to eleventh inclusive with a pair of large, light-brown, oval spots. Anal plate light brown, except a median band of blackish-brown, convex behind. First plate light brown, except a median irregular and two lateral blackish-brown spots. Below each stigmata, on the fourth to eleventh segments inclusive, are two longitudinal folds, the anterior half of each fold

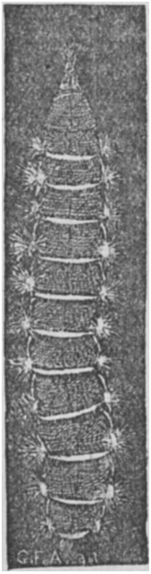

FIG. 1.—*Phengodes laticollis*, showing luminosity.

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[1] Comptes Rendus, civ., 1887, p. 737.

[2] Chrustchoff, Neues Jahrb. f. Min., etc., 1887, i. p. 205.

[3] E. Döll, Verh. k. k. geol. Reichs., 14, p. 350.

[4] Ib., 1886, p. 464.

[5] This department is edited by Prof. J. H. COMSTOCK, Cornell University, Ithaca, N. Y., to whom communications, books for notice, etc., should be sent.

[6] Am. Nat., xx. 648. See also Ent. Am., iii. 203.

blackish-brown, shading into light brown in the middle, and becoming yellowish-white, with an olive tinge on the posterior half. Posterior edge of each dorsal plate dark olive-brown; the posterior angles of the pro-, meso-, and meta-thoracic plate and the anterior third of the pro-thoracic plate yellowish-white, tinged with olive. On the fifth to ninth segments inclusive (ventral surface) are one pair each of small, elongated, black dots, corresponding very nearly in position with the pairs of luminous organs of the ventral surface. Anal proleg blackish-brown above, yellowish-white below.

Besides the stigmata on the fourth to eleventh segments, there is one on the ventral surface of each anterior corner of the mesothoracic segment; also two pairs of small dorsal spiracles, one each between the fourth and fifth, and fifth and sixth segments.

Thoracic legs brown, suffused with yellowish-olive. Tarsus two-jointed; single claw curved. Anterior edge of femur with a row of short hairs; under edge of tibia and first joint of tarsus with a similar row of hairs; under edge of last joint of tarsus with small, short papillæ. Head black, 2½ mm. in width, retractile. Mandibles curved, sickle-shaped, black. Antennæ four-jointed; labial palpi two-jointed (or three-jointed? Those of a larva collected in July appear three-jointed); maxillary palpi four-jointed.

The location and form of the phosphorescent lights are as follows: On each side is a row of circular ones, one on each segment from the second to the twelfth inclusive. Each of these is nearly one-eighth inch in diameter, and situated in the posterior end of the upper longitudinal fold. The posterior edge of each segment, from the second to the twelfth inclusive, emits a band of light. On the under surface are five pair, mere points, one pair each on the fifth to ninth segments.

The general appearance is that of a worm beautifully illuminated with bluish-white lights, which are disposed in a longitudinal row on each side, and in transverse bands. (See Fig. 1.)

The insect was placed in a small, elongated vial, so that I might easily observe and exhibit the display of lights. The light was brilliant until 11 P.M. on the night of September 27. At 2 A.M. the 28th the phosphorescence had disappeared. It did not appear again until the night of the 30th, when, by disturbing the insect, the lights began to glow, but continued only for a few hours. For a few nights within the space of a week I observed that the insect glowed only when disturbed. After that the posphorescence reappeared, and I do not believe once disappeared again until it was placed in alcohol, June 16, 1887.

October 1, 1886, I placed it in a glass jar of earth. It made a cell in the earth next the side of the jar, where I could observe the phosphorescence, and where it remained (excepting one warm day in February, 1887, when it came to the surface, and returned at night when I placed the jar in a cooler place in my room) coiled up until the 15th of April. At that time the luminosity was becoming more brilliant and the brown color was disappearing, to be replaced by a uniform cream color.

I removed the earth from above the cell and took the insect in my hand. It immediately straightened and began crawling. When placed in the jar it sought its cell and there remained. Instead of returning the earth I placed a glass over it, so that I might observe the beautiful display of light. It was so strong that I could read print by it when the letters were one-eighth inch long. About the 1st of May it cast its skin and became of a uniform cream color, lighter on the sides and ventral surface and between the segments of the dorsum.

Every night it came from its cell and wandered about the jar, probably striving to attract its mate. May 8 I took it out of doors at night, and placed it on the ground for about fifteen minutes. Nothing was attracted. Twice I took it in the daytime,—the 10th and 12th of May,—but nothing was attracted.

May 19 I placed it, with another (collected by Professor Holmes), in a large, open, glass jar, with about one inch in depth of earth. This I partly sunk in the earth in the open woods just at dusk. At nine o'clock the same evening I visited the place and saw a male within the jar. When it left its mate I caught it.[1] On the following morning I found another male outside the jar. The following night I captured two more males. During the day the females remained beneath the surface of the earth.

The luminosity in this case is decidedly of sexual significance, attracting the males at night. Mr. Rivers concluded that the luminosity of the female *Zarhipis riversi* was not of sexual significance, as males were attracted by day. He was at a loss to account for its utility.

Soon after meeting with the males the females became less active, and the luminosity, though plainly visible, was less in brilliancy. About June 4 they made each a cell in the earth and began depositing eggs. One deposited about twenty, and the other about thirty-five. The eggs are dull whitish in color, 3 mm. to 4 mm. in diameter. This, I believe, is the first instance on record of the eggs of any of the *Phengodini*. The female is coiled up in the cell while depositing the eggs, and afterwards lies coiled up on them. They are then very weak, and soon die. Can it be that the parent yields its dying or dead body as the first meal for its young? One which was found in September, 1886, was taken from the eggs when nearly dead and placed in alcohol. The eggs of this one proved infertile. The mouth parts, and especially the legs, were very much atrophied, and description was wellnigh impossible. In general appearance the adult is very much like that of the larva and pupa. The two

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[1] Determined by Professor Riley as *Phengodes laticollis* Horn.

which I observed did not, however, resume the dark-brown color, but remained of a uniform pale-cream color, lighter on sides, under parts, and between the segments of the dorsum.

Occasionally during the adult state the one which I kept through the winter showed signs of luminosity on the prothoracic segment, but mainly shone as represented in Fig. 1. The other one exhibited no sign of luminosity on the pro- and meso-thoracic segments. Otherwise it was like Fig. 1. Professor Riley, seven years ago, figured a similar phosphorescent insect,[1] and in the paper, read before the Washington Entomological Society, he says that one found by him in 1869 was figured in Le Baron's fourth Illinois report.

The males are insignificant when compared to the females in size and beauty. They are 15 mm. to 20 mm. in length. Antennæ plumose, and half, or more than half, as long as the body. The elytra are short, thin, and subulate.—*Geo. F. Atkinson, University of North Carolina, Chapel Hill,* July 7, 1887.

ZOOLOGY.

The Irish Marine Fauna.—The *Proceedings of the Royal Irish Academy* (vol. iv. of the second series) contains two preliminary reports on the marine fauna of Ireland. One is by Prof. Alfred Haddon, and treats of the fauna of Dublin Bay. The other is the report of the Committee on the Marine Fauna of Southwestern Ireland, and gives an account of their explorations, the different groups being treated by specialists, in a manner similar to that adopted by the Liverpool committee. There is abundant room for similar work on the American shores, but the policy of centralization adopted by the United States Fish Commission has a discouraging effect.

Von Lendenfeld on Sponges.—Dr. R. von Lendenfeld has an extensive paper on the "Position and Classification of Sponges" in a recent part of the *Proceedings of the Zoological Society of London.* His views on most points are similar to those of Vosmaer. On account of the absence of a cœlom, he regards them as true members of the Cœlenterata,—a group which he divides into two phyla, Mesodermalia, embracing the sponges, and Epithelaria, including the true Cœlenterates of other authors. He regards the mesoderm of the sponges as a modification of the mesoglœa of the Cœlenterates, and homologous with it. His definition of the Mesodermalia is "Cœlenterata with permeating canal-system, and organs developed from the cells of the mesoglœa, or primary mesoderm. No movable appendages." This phylum has but a single class, Spongiæ, which is subdivided as follows:

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[1] American Entomologist, vol. iii.; new series, vol. i., 1880, p. 202.